LUD-5531.1 (09885374)

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PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s)   :   Van der Bruggen et al.

Serial No.   :   09/782,745

Filed   :   February 13, 2001

For   :   ISOLATED POLYPEPTIDES WHICH BIND TO HLA-A29 MOLECULES, NUCLEIC ACID AND MOLECULES ENCODING THESE, AND USES THEREOF

Group Art Unit: to be assigned

Examiner   :   to be assigned

May 2, 2001

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

REQUEST
FOR SEQUENCE
TRANSFER
(37 CFR § 1.821(e))

Sir:

The above referenced application is a divisional of Serial No. 09/012,818, filed on January 23, 1998. Please transfer the computer readable form of sequence information submitted in the patent application on July 23, 1999 to the above referenced application. Please CANCEL the current paper copy of sequence information presented in this application, and replace it with the attached. The undersigned hereby declares that, to the best of his knowledge, the information

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presented in computer readable form is identical to information presented in the attached paper copy of sequence information, and both are identical to information set forth in the above referenced application as filed. No new matter is believed presented.

Respectfully submitted,

FULBRIGHT & JAWORSKI, L.L.P.

By _____
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(1) GENERAL INFORMATION:

(i)   APPLICANTS: Van der Bruggen, Pierre; Van den Eynde, Benoit; DeBacker, Olivier; Boon-Falleur, Thierry

(ii)   TITLE OF INVENTION: Isolated, Polypeptides Which Bind to HLA-A29 Molecules, Nucleic Acid, The Molecules Encoding These, and Uses Thereof

(iii)   NUMBER OF SEQUENCES: 31

(iv)   CORRESPONDENCE ADDRESS:
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(v)   COMPUTER READABLE FORM:
(A) MEDIUM TYPE: Diskette, 3.5 inch, 1.44 kb storage
(B) COMPUTER: IBM PS/2
(C) OPERATING SYSTEM: PC
(D) SOFTWARE: Wordperfect

(vi)   CURRENT APPLICATION DATA:
(A) APPLICATION NUMBER:
(B) FILING DATE:
(C) CLASSIFICATION: 435

(vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: 09/012,818
(B) FILING DATE: 23-January-1998
(C) CLASSIFICATION: 435

(vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: 08/531,662
(B) FILING DATE: 21-September-1995

(vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: 08/370,648
(B) FILING DATE: 10-January-1995

(vii) PRIOR APPLICATION DATA:
(A) APPLICATION NUMBER: 08/250,162
(B) FILING DATE: 27-May-1994

546121.1

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(vii)   PRIOR APPLICATION DATA:
      (A) APPLICATION NUMBER: 08/096,039
      (B) FILING DATE: 22-July-1993

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      (C) REFERENCE/DOCKET NUMBER: LUD 5531 PCT

(ix)   TELECOMMUNICATION INFORMATION:
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(2)   INFORMATION FOR SEQ ID NO: 1:
    (i)   SEQUENCE CHARACTERISTICS:
      (A) LENGTH: 646 base pairs
      (B) TYPE: nucleic acid
      (C) STRANDEDNESS: single
      (D) TOPOLOGY: linear
    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO:1:

```
CTGCCGTCCG GACTCTTTTT CCTCTACTGA GATTCATCTG TGTGAAATAT    50

GAGTTGGCGA GGAAGATCGA CCTATCGGCC TAGACCAAGA CGCTACGTAG   100

AGCCTCCTGA AATGATTGGG CCTATGCGGC CCGAGCAGTT CAGTGATGAA   150

GTGGAACCAG CAACACCTGA AGAAGGGGAA CCAGCAACTC AACGTCAGGA   200

TCCTGCAGCT GCTCAGGAGG GAGAGGATGA GGGAGCATCT GCAGGTCAAG   250

GGCCGAAGCC TGAAGCTGAT AGCCAGGAAC AGGGTCACCC ACAGACTGGG   300

TGTGAGTGTG AAGATGGTCC TGATGGGCAG GAGATGGACC CGCCAAATCC   350

AGAGGAGGTG AAAACGCCTG AAGAAGAGAT GAGGTCTCAC TATGTTGCCC   400

AGACTGGGAT TCTCTGGCTT TTAATGAACA ATTGCTTCTT AAATCTTTCC   450

CCACGGAAAC CTTGAGTGAC TGAAATATCA AATGGCGAGA GACCGTTTAG   500

TTCCTATCAT CTGTGGCATG TGAAGGGCAA TCACAGTGTT AAAAGAAGAC   550

ATGCTGAAAT GTTGCAGGCT GCTCCTATGT TGGAAAATTC TTCATTGAAG   600

TTCTCCCAAT AAAGCTTTAC AGCCTTCTGC AAAGAAAAAA AAAAAA       646
```

(2)   INFORMATION FOR SEQ ID NO: 2:
    (i)   SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 18 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear
    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 2:

AGACGCTACG TAGAGCCT   18

(2)   INFORMATION FOR SEQ ID NO: 3:
    (i)   SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 18 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear
    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 3:

CCATCAGGAC CATCTTCA   18

(2)   INFORMATION FOR SEQ ID NO: 4:
    (i)   SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 8 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear
    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 4:

Tyr Arg Pro Arg Pro Arg Arg Tyr
1   5

(2)   INFORMATION FOR SEQ ID NO: 5:
    (i)   SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 9 amino acids
        (B) TYPE: amino acid
        (D) TOPOLOGY: linear
    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 5:

Thr Tyr Arg Pro Arg Pro Arg Arg Tyr
1   5

(2)   INFORMATION FOR SEQ ID NO: 6:
        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 9 amino acids
                (B) TYPE: amino acid
                (D) TOPOLOGY: linear
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 6:

Tyr Arg Pro Arg Pro Arg Arg Tyr Val
 1   5

(2)   INFORMATION FOR SEQ ID NO: 7:
        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 10 amino acids
                (B) TYPE: amino acid
                (D) TOPOLOGY: linear
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Thr Tyr Arg Pro Arg Pro Arg Arg Tyr Val
 1   5   10

(2)   INFORMATION FOR SEQ ID NO: 8:
        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 9 amino acids
                (B) TYPE: amino acid
                (D) TOPOLOGY: linear
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 8:

Arg Pro Arg Pro Arg Arg Tyr Val Glu
 1   5

(2)   INFORMATION FOR SEQ ID NO: 9:
        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 18 base pairs
                (B) TYPE: nucleic acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 9:

GACCAAGACG CTACGTAG   18

(2)   INFORMATION FOR SEQ ID NO: 10:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 18 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 10:

CCATCAGGAC CATCTTCA   18

(2)   INFORMATION FOR SEQ ID NO: 11:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 17 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 11:

GCGGCCCGAG CAGTTCA   17

(2)   INFORMATION FOR SEQ ID NO: 12:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 15 amino acids
              (B) TYPE: amino acid
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 12:

Met Ser Trp Arg Gly Arg Ser Thr Tyr Arg Pro Arg Pro Arg Arg
  1   5   10   15

(2)   INFORMATION FOR SEQ ID NO: 13:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 16 amino acids
              (B) TYPE: amino acid
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 13:

Thr Tyr Arg Pro Arg Pro Arg Arg Tyr Val Glu Pro Pro Glu Met Ile
  1   5   10   15

(2)   INFORMATION FOR SEQ ID NO: 14:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 538 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 14:

```
ACGCCAGGGA GCTGTGAGGC AGTGCTGTGT GGTTCCTGCC GTCCGGACTC    50

TTTTTCCTCT ACTGAGATTC ATCTGTGTGA AATATGAGTT GGCGAGGAAG   100

ATCGACCTAT CGGCCTAGAC CAAGACGCTA CGTAGAGCCT CCTGAAATGA   150

TTGGGCCTAT GCGGCCCGAG CAGTTCAGTG ATGAAGTGGA ACCAGCAACA   200

CCTGAAGAAG GGGAACCAGC AACTCAACGT CAGGATCCTG CAGCTGCTCA   250

GGAGGGAGAG GATGAGGGAG CATCTGCAGG TCAAGGGCCG AAGCCTGAAG   300

CTCATAGCCA GGAACAGGGT CACCCACAGA CTGGGTGTGA GTGTGAAGAT   350

GGTCCTGATG GGCAGGAGAT GGACCCGCCA AATCCAGAGG AGGTGAAAAC   400

GCCTGAAGAA GGTGAAAAGC AATCACAGTG TTAAAGAAG ACACGTTGAA    450

ATGATGCAGG CTGCTCCTAT GTTGGAAATT TGTTCATTAA AATTCTCCCA   500

ATAAAGCTTT ACAGCCTTCT GCAAAGAAAA AAAAAAAA                538
```

(2)   INFORMATION FOR SEQ ID NO: 15:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 560 base pairs
              (B) TYPE: nucleic acid
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 15:

```
CTCATATTTC ACACAGATGA GTTGGCGAGG AAGATCGACC TATTATTGGT    50

CTAGGCCAAT AATAGGTCGA TCTTCCTCGC CAACTCATAT TTCACACAGA   100

TGAATCTCAG TAGAGGAAAA TCGACCTATT ATTGGCCTAG ACCAAGGCGC   150

TATGTACAGC CTCCTGAAGT GATTGGGCCT ATGCGGCCCG AGCAGTTCAG   200

TGATGAAGTG GAACCAGCAA CACCTGAAGA AGGGGAACCA GCAACTCAAC   250
```

GTCAGGATCC TGCAGCTGCT CAGGAGGGAG AGGATGAGGG AGCATCTGCA 300

GGTCAAGGGC CGAAGCCTGA AGCTGATAGC CAGGAACAGG GTCACCCACA 350

GACTGGGTGT GAGTGTGAAG ATGGTCCTGA TGGGCAGGAG ATGGACCCGC 400

CAAATCCAGA GGAGGTGAAA ACGCCTGAAG AAGGTGAAAA GCAATCACAG 450

TGTTAAAAGA AGGCACGTTG AAATGATGCA GGCTGCTCCT ATGTTGGAAA 500

TTTGTTCATT AAAATTCTCC CAATAAAGCT TTACAGCCTT CTGCAAAGAA 550

AAAAAAAAAA 560

(2) INFORMATION FOR SEQ ID NO: 16:
      (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 540 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: single
          (D) TOPOLOGY: linear
      (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

CGCCAGGGAG CTGTGAGGCA GTGCTGTGTG GTTCCTGCCG TCCGGACTCT 50

TTTTCCTCTA CTGAGATTCA TCTGTGTGAA ATATGAGTTG GCGAGGAAGA 100

TCGACCTATT ATTGGCCTAG ACCAAGGCGC TATGTACAGC CTCCTGAAAT 150

GATTGGGCCT ATGCGGCCCG AGCAGTTCAG TGATGAAGTG GAACCAGCAA 200

CACCTGAAGA AGGGGAACCA GCAACTCAAC GTCAGGATCC TGCAGCTGCT 250

CAGGAGGGAG AGGATGAGGG AGCATCTGCA GGTCAAGGGC CGAAGCCTGA 300

AGCTGATAGC CAGGAACAGG GTCACCCACA GACTGGGTGT GAGTGTGAAG 350

ATGGTCCTGA TGGGCAGGAG ATGGACCCGC CAAATCCAGA GGAGGTGAAA 400

ACGCCTGAAG AAGGTGAAAA GCAATCACAG TGTTAAAAGA AGGCACGTTG 450

AAATGATGCA GGCTGCTCCT ATGTTGGAAA TTTGTTCATT AAAATTCTCC 500

CAATAAAGCT TTACAGCCTT CTGCAAAAAA AAAAAAAAAA 540

(2)   INFORMATION FOR SEQ ID NO: 17:
    (i)   SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 532 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear
    (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 17:

```
AGCTGTGAGG CAGTGCTGTG TGGTTCCTGC CGTCCGGACT CTTTTTCCTC    50

TACTGAGATT CATCTGTGTG AAATATGAGT TGGCGAGGAA GATCGACCTA   100

TTATTGGCCT AGACCAAGGC GCTATGTACA GCCTCCTGAA GTGATTGGGC   150

CTATGCGGCC CGAGCAGTTC AGTGATGAAG TGGAACCAGC AACACCTGAA   200

GAAGGGGAAC CAGCAACTCA ACGTCAGGAT CCTGCAGCTG CTCAGGAGGG   250

AGAGGATGAG GGAGCATCTG CAGGTCAAGG GCCGAAGCCT GAAGCTGATA   300

GCCAGGAACA GGGTCACCCA CAGACTGGGT GTGAGTGTGA AGATGGTCCT   350

GATGGGCAGG AGATGGACCC GCCAAATCCA GAGGAGGTGA AAACGCCTGA   400

AGAAGGTGAA AAGCAATCAC AGTGTTAAAA GAAGGCACGT TGAAATGATG   450

CAGGCTGCTC CTATGTTGGA AATTTGTTCA TTAAAATTCT CCCAATAAAG   500

CTTTACAGCC TTCTGCAAAG AAAAAAAAAA AA                       532
```

(2)   INFORMATION FOR SEQ ID NO: 18:
    (i)   SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 539 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear
    (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

```
GCCAGGGAGC TGTGAGGCAG TGCTGTGTGG TTCCTGCCGT CCGGACTCTT    50

TTTCCTCTAC TGAGATTCAT CTGTGTGAAA TATGAGTTGG CGAGGAAGAT   100

CGACCTATTA TTGGCCTAGA CCAAGGCGCT ATGTACAGCC TCCTGAAGTG   150

ATTGGGCCTA TGCGGCCCGA GCAGTTCAGT GATGAAGTGG AACCAGCAAC   200

ACCTGAAGAA GGGGAACCAG CAACTCAACG TCAGGATCCT GCAGCTGCTC   250
```

```
AGGAGGGAGA  GGATGAGGGA  GCATCTGCAG  GTCAAGGGCC  GAAGCCTGAA      300

GCTGATAGCC  AGGAACAGGG  TCACCCACAG  ACTGGGTGTG  AGTGTGAAGA      350

TGGTCCTGAT  GGGCAGGAGG  TGGACCCGCC  AAATCCAGAG  GAGGTGAAAA      400

CGCCTGAAGA  AGGTGAAAAG  CAATCACAGT  GTTAAAAGAA  GACACGTTGA      450

AATGATGCAG  GCTGCTCCTA  TGTTGGAAAT  TTGTTCATTA  AAATTCTCCC      500

AATAAAGCTT  TACAGCCTTC  TGCAAAAAAA  AAAAAAAAA                   539
```

(2)   INFORMATION FOR SEQ ID NO: 19:
        (i)   SEQUENCE CHARACTERISTICS:
                 (A) LENGTH: 17 base pairs
                 (B) TYPE: nucleic acid
                 (C) STRANDEDNESS: single
                 (D) TOPOLOGY: linear
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 19:

ACTCCATGAG GTATTTC   17

(2)   INFORMATION FOR SEQ ID NO: 20:
        (i)   SEQUENCE CHARACTERISTICS:
                 (A) LENGTH: 17 base pairs
                 (B) TYPE: nucleic acid
                 (C) STRANDEDNESS: single
                 (D) TOPOLOGY: linear
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 20:

TTTCACCACA TGCGTGT   17

(2)   INFORMATION FOR SEQ ID NO: 21:
        (i)   SEQUENCE CHARACTERISTICS:
                 (A) LENGTH: 14 amino acids
                 (B) TYPE: amino acid
                 (D) TOPOLOGY: linear
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 21:

Arg Ser Thr Tyr Tyr Trp Pro Arg Pro Arg Arg Tyr Val Gln
 1   5   10

(2)   INFORMATION FOR SEQ ID NO: 22:
        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 9 amino acids
                (B) TYPE: amino acid
                (D) TOPOLOGY: linear
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 22:

Tyr Tyr Trp Pro Arg Pro Arg Arg Tyr
1   5

(2)   INFORMATION FOR SEQ ID NO: 23:
        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 9 amino acids
                (B) TYPE: amino acid
                (D) TOPOLOGY: linear
        (ix)   FEATURE:
                (D) OTHER INFORMATION: Each Xaa may be any amino acid
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 23:

Xaa Xaa Trp Pro Xaa Xaa Xaa Xaa Tyr
1   5

(2)   INFORMATION FOR SEQ ID NO: 24:
        (i)   SEQUENCE CHARACTERISTICS:
                (A) LENGTH: 9 amino acids
                (B) TYPE: amino acid
                (D) TOPOLOGY: linear
        (ix)   FEATURE:
                (D) OTHER INFORMATION: Each Xaa may be any amino acid
        (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 24:

Xaa Xaa Trp Xaa Arg Xaa Xaa Xaa Tyr
1   5

(2)   INFORMATION FOR SEQ ID NO: 25:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 9 amino acids
              (B) TYPE: amino acid
              (D) TOPOLOGY: linear
       (ix)   FEATURE:
              (D) OTHER INFORMATION: Each Xaa may be any amino acid
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 25:

Xaa Xaa Trp Xaa Xaa Xaa Xaa Arg Tyr
  1   5

(2)   INFORMATION FOR SEQ ID NO: 26:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 138 amino acids
              (B) TYPE: protein
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 26:

Met Ser Trp Arg Gly Arg Ser Thr Tyr Arg Pro Arg Pro Arg Arg Tyr
  1   5   10   15
Val Glu Pro Pro Glu Met Ile Gly Pro Met Arg Pro Glu Gln Phe Ser
              20   25   30
Asp Glu Val Glu Pro Ala Thr Pro Glu Glu Gly Glu Pro Ala Thr Gln
          35   40   45
Arg Gln Asp Pro Ala Ala Ala Gln Glu Gly Glu Asp Glu Gly Ala Ser
        50   55   60
Ala Gly Gln Gly Pro Lys Pro Glu Ala Asp Ser Gln Glu Gln Gly His
  65   70   75   80
Pro Gln Thr Gly Cys Glu Cys Glu Asp Gly Pro Asp Gly Gln Glu Met
              85   90   95
Asp Pro Pro Asn Pro Glu Glu Val Lys Thr Pro Glu Glu Glu Met Arg
              100   105   110
Ser His Tyr Val Ala Gln Thr Gly Ile Leu Trp Leu Leu Met Asn Asn
          115   120   125
Cys Phe Leu Asn Leu Ser Pro Arg Lys Pro
  130   135

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(2)   INFORMATION FOR SEQ ID NO: 27:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 116 amino acids
              (B) TYPE: protein
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 27:

```
Met Ser Trp Arg Gly Arg Ser Thr Tyr Arg Pro Arg Pro Arg Arg Tyr
1               5                   10                  15
Val Glu Pro Pro Glu Met Ile Gly Pro Met Arg Pro Glu Gln Phe Ser
            20                  25                  30
Asp Glu Val Glu Pro Ala Thr Pro Glu Glu Gly Glu Pro Ala Thr Gln
        35                  40                  45
Arg Gln Asp Pro Ala Ala Ala Gln Glu Gly Glu Asp Glu Gly Ala Ser
        50                  55                  60
Ala Gly Gln Gly Pro Lys Pro Glu Ala His Ser Gln Glu Gln Gly His
65                  70                  75                  80
Pro Gln Thr Gly Cys Glu Cys Glu Asp Gly Pro Asp Gly Gln Glu Met
                85                  90                  95
Asp Pro Pro Asn Pro Glu Glu Val Lys Thr Pro Glu Glu Gly Glu Lys
                100                 105                 110
Gln Ser Gln Cys
        115
```

(2)   INFORMATION FOR SEQ ID NO: 28:
       (i)   SEQUENCE CHARACTERISTICS:
              (A) LENGTH: 118 amino acids
              (B) TYPE: protein
              (C) STRANDEDNESS: single
              (D) TOPOLOGY: linear
       (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 28:

```
Met Asn Leu Ser Arg Gly Lys Ser Thr Tyr Tyr Trp Pro Arg Pro Arg
1               5                   10                  15
Arg Tyr Val Gln Pro Pro Glu Val Ile Gly Pro Met Arg Pro Glu Gln
            20                  25                  30
Phe Ser Asp Glu Val Glu Pro Ala Thr Pro Glu Glu Gly Glu Pro Ala
        35                  40                  45
Thr Gln Arg Gln Asp Pro Ala Ala Ala Gln Glu Gly Glu Asp Glu Gly
        50                  55                  60
Ala Ser Ala Gly Gln Gly Pro Lys Pro Glu Ala Asp Ser Gln Glu Gln
65                  70                  75                  80
Gly His Pro Gln Thr Gly Cys Glu Cys Glu Asp Gly Pro Asp Gly Gln
                85                  90                  95
```

Glu Met Asp Pro Pro Asn Pro Glu Glu Val Lys Thr Pro Glu Glu Gly
        100   105   110

Glu Lys Gln Ser Gln Cys
      115

(2)   INFORMATION FOR SEQ ID NO: 29:
      (i)   SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 117 amino acids
            (B) TYPE: protein
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear
      (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 29:

Met Ser Trp Arg Gly Arg Ser Thr Tyr Tyr Trp Pro Arg Pro Arg Arg
1   5   10   15

Tyr Val Gln Pro Pro Glu Met Ile Gly Pro Met Arg Pro Glu Gln Phe
          20   25   30

Ser Asp Glu Val Glu Pro Ala Thr Pro Glu Glu Gly Glu Pro Ala Thr
        35   40   45

Gln Arg Gln Asp Pro Ala Ala Ala Gln Glu Gly Glu Asp Glu Gly Ala
      50   55   60

Ser Ala Gly Gln Gly Pro Lys Pro Glu Ala Asp Ser Gln Glu Gln Gly
65   ·   70   75   80

His Pro Gln Thr Gly Cys Glu Cys Glu Asp Gly Pro Asp Gly Gln Glu
            85   90   95

Met Asp Pro Pro Asn Pro Glu Glu Val Lys Thr Pro Glu Glu Gly Glu
        100   105   110

Lys Gln Ser Gln Cys
      115

(2)   INFORMATION FOR SEQ ID NO: 30:
      (i)   SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 117 amino acids
            (B) TYPE: protein
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear
      (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 30:

Met Ser Trp Arg Gly Arg Ser Thr Tyr Tyr Trp Pro Arg Pro Arg Arg
1   5   10   15

Tyr Val Gln Pro Pro Glu Val Ile Gly Pro Met Arg Pro Glu Gln Phe
          20   25   30

Ser Asp Glu Val Glu Pro Ala Thr Pro Glu Glu Gly Glu Pro Ala Thr
        35   40   45

Gln Arg Gln Asp Pro Ala Ala Ala Gln Glu Gly Glu Asp Glu Gly Ala
     50   55   60

Ser Ala Gly Gln Gly Pro Lys Pro Glu Ala Asp Ser Gln Glu Gln Gly
65   70   75   80

His Pro Gln Thr Gly Cys Glu Cys Glu Asp Gly Pro Asp Gly Gln Glu
           85   90   95

Met Asp Pro Pro Asn Pro Glu Glu Val Lys Thr Pro Glu Glu Gly Glu
       100   105   110

Lys Gln Ser Gln Cys
     115

(2)   INFORMATION FOR SEQ ID NO: 31:

     (i)   SEQUENCE CHARACTERISTICS:

          (A) LENGTH: 117 amino acids

          (B) TYPE: protein

          (C) STRANDEDNESS: single

          (D) TOPOLOGY: linear

     (xi)   SEQUENCE DESCRIPTION: SEQ ID NO: 31:

Met Ser Trp Arg Gly Arg Ser Thr Tyr Tyr Trp Pro Arg Pro Arg Arg
1   5   10   15

Tyr Val Gln Pro Pro Glu Val Ile Gly Pro Met Arg Pro Glu Gln Phe
          20   25   30

Ser Asp Glu Val Glu Pro Ala Thr Pro Glu Glu Gly Glu Pro Ala Thr
        35   40   45

Gln Arg Gln Asp Pro Ala Ala Ala Gln Glu Gly Glu Asp Glu Gly Ala
     50   55   60

Ser Ala Gly Gln Gly Pro Lys Pro Glu Ala Asp Ser Gln Glu Gln Gly
65   70   75   80

His Pro Gln Thr Gly Cys Glu Cys Glu Asp Gly Pro Asp Gly Gln Glu
           85   90   95

Val Asp Pro Pro Asn Pro Glu Glu Val Lys Thr Pro Glu Glu Gly Glu
       100   105   110

Lys Gln Ser Gln Cys
     115